purple mash

Computing Scheme of Work

Essential Knowledge

Year 1 to Year 6

CONTENTS

Introduction

This document aims to support teachers in identifying the key components of knowledge found in each unit of work for years 1 to 6.

It's important to note that this document provides a more detailed breakdown of knowledge children should acquire as they complete each unit of work. The progression documents and knowledge organisers contain broader statements of learning (skills and knowledge).

Teachers might choose to use this document in replacement of one of our other curriculum documents or alongside to help them identify smaller steps of intended knowledge acquisition.

Quick Links to related documentation

Assessment Guide
Progression of Skills & Knowledge Folder
SOW Overview (PDF)
SOW Overview (Excel)
Assessment Tools Folder
Knowledge Organisers (See Individual Year Groups From Main SOW page)

Year 1

Unit 1.1 – Online Safety
- Knows how to log in safely.
- Knows how to navigate to a document area where saved work by child can be found.
- Knows how to use search to locate applications or resources on a platform such as Purple Mash.
- Knows how to enhance work by adding multimodal items such as text and images.
- Knows how to open, save and print work.
- Knows the importance of logging out of an account.

Unit 1.5 – Maze Explorers
- Knows the functionality of the direction keys in 2GO.
- Knows how to create and debug a set of simple instructions (algorithm).
- Knows how to use the additional direction keys within 2Go as part of an algorithm.
- Knows how to change and extend the algorithm list in 2Go.

Unit 1.2 – Grouping & Sorting
- Knows how to sort items using a range of criteria.
- Knows how to use software for grouping items such as tools within Purple Mash.
- Knows that computers need steps of instructions in order in their programs.

Unit 1.3 - Pictograms
- Knows that data can be represented in a picture format e.g. pictogram.
- Knows how to contribute to a class pictogram.
- Knows how to use a software such as 2Count to record results of an experiment into a pictogram format.

2 simple

Unit 1.6 – Animated Story Books
- Knows what e-books are.
- Knows of software such as 2Create a Story that allows users to create interactive stories.
- Knows how to add animation to an interactive story.
- Knows how to add sound, including voice recordings and music to a story they have created using software.
- Beginning to know how to work on more complex digital stories, including adding backgrounds, copying and pasted pages.
- Knows how to share digital stories with others such as using Digital Display Boards.

Unit 1.7 – Coding
- Knows what instructions are and can predict what might happen when they are followed.
- Knows how to plan and make a simple computer program e.g. fish moves right, crab moves up.
- Knows what objects, actions and backgrounds are within a coding environment.
- Knows what an event is and knows how to use an event to control an object.
- Beginning to know how code executes when a program is run.

Unit 1.4 – Lego Builders
- Knows how to compare the effects of adhering strictly to instructions when completing tasks without complete instructions.
- Knows how to follow and create simple instructions on the computer.
- Knows that the order of instructions affects the end result for a given instructional task.

Unit 1.9 – Tech Outside School
- Knows that technology is a use of knowledge to invent new devices or tools.
- Knows that throughout history, technology has made people's lives easier.
- Knows that technology is used within school and outside of school.
- Knows where examples of technology can be found both in and out of school.

Year 2

Unit 2.1 – Coding

- Knows what an algorithm is and can explain that it is a set of instructions and that algorithms follow a sequence.
- Knows how to create a computer program using an algorithm.
- Knows how to create a computer program from a given design.
- Knows that collision detection is an event type in coding.
- Knows how to design an algorithm that follows a timed sequence.
- Knows that different objects within the coding environment have different properties.
- Knows that there are different events in coding and knows what some of these events are.
- Knows the function of buttons in the coding environment.
- Knows how to interpret and debug simple programs.

Unit 2.2 – Online Safety

- Knows how searches can be refined when searching digitally and therefore attempts refining when searching.
- Knows that digitally created work can be shared with others e.g. Purple Mash Display Boards.
- Has knowledge and understanding about sharing more globally on the Internet.
- Knows that email is a type of communication tool.
- Knows how to open and send simple online communications in the form of email e.g. 2Email (virtual email client).
- Knows that there is an appropriate way to communicate with others in an online situation.
- Knows that information put online leaves a digital footprint.
- Knows some steps that can be taken to keep personal data and hardware secure.

Unit 2.3 – Spreadsheets

- Knows what a spreadsheet looks like and how to describe rows and columns.
- Can add images to a spreadsheet and assign them values.
- Knows what totalling tools are and how to use them.
- Knows how to use a spreadsheet to perform calculations for purpose. For example, adding and totalling money.
- Knows how to use some tools within a spreadsheet to support calculations. For example, using the equals tool in 2Calculate to check calculations.
- Knows how to create a simple graph within a spreadsheet from data.

Unit 2.4 – Questioning

- Knows that pictograms provide limited information.
- Knows that there are other data handling tools that can give more information than pictograms.
- Knows how to use yes/no questions to separate information.
- Knows how to construct a binary tree to identify items.
- Knows how to use a binary tree database (such as 2Question), to answer questions.
- Knows how to use a database to answer more complex search questions.
- Knows how to use a search feature at a basic level when trying to locate data within a database such as 2Investigate.

Unit 2.5 – Effective Searching

- Knows the meaning of key Internet and searching terms.
- Knows the basic parts of a web search engine page.
- Knows how to navigate a web search results page.
- Knows how to search the Internet to some degree for answers to a quiz.
- Knows the premise of what effective Internet searching is.

Unit 2.6 – Creating Pictures

- Knows the purpose and benefits of painting software tools such as 2Paint a Picture.
- Knows how to recreate Impressionism, surrealism and Pointillism using features within 2Paint a Picture.
- Knows how to reproduce the style of William Morris by using repeating patterns, manipulating patterns and adding multiple effects in painting software such as 2Paint a picture.

Unit 2.7 – Making Music

- Knows how to make forms of music (digitally) using age-appropriate software such as 2Sequence.
- Knows how to edit and combine sounds using 2Sequence.
- Knows how to refine composed music.
- Knows how to upload/import and record sounds beyond the software environment.

Unit 2.8 – Presenting Ideas

- Know that digital content can be presented in many different forms e.g. stories.
- Know how to use presentational or interactive software such as a quiz, making improvements to it based on people feedback.
- Know that data can be structured in tables to make it useful for an audience.
- Know how to add images such as clipart and photos to presentational software.
- Know how to collect, organise and present data and information in digital format.

Year 3

Unit 3.1 – Coding

- Knows what a flowchart is and how flowcharts are used in computer programming.
- Knows how to use a flowchart to create a computer program.
- Knows that there are different types of timers used in coding environments such as 2Code.
- Knows which timer should be used for a given purpose.
- Know what a repeat command is and how to use the repeat command.
- Know how to create a range of programs using coding knowledge.
- Know how to run, test and debug their own programs.
- Know what nesting is and that this should be considered when debugging.
- Know how to change attributes/properties of any objects in a program they have made.

Unit 3.2 – Online Safety

- Knows what makes a safe password and how to keep it safe.
- Knows the main outcomes of not keeping passwords safe.
- Knows all the common ways the Internet enables people to effectively communicate.
- Know that a blog can be used to help communicate with a wider audience.
- Know how to contribute to a blog with clear and appropriate messages.
- Know that some information held on websites may not be accurate or true.
- Beginning to know how to search the Internet and how to think critically about the results returned.
- Know why there are age restrictions on digital media and devices.
- Know where to turn to for help if they see inappropriate content or have inappropriate contact from others.

Unit 3.3 – Spreadsheets

- Know how to create tables of data within a spreadsheet.
- Can correctly use cell addresses to describe locations on a spreadsheet.
- Can follow the steps for using the formula wizard to insert formulae.
- Know how to use a spreadsheet program to automatically create charts and graphs from data.
- Know how to use various tools within a spreadsheet to support solutions to calculations. For example, the timer, random number generator and spin tool.

Unit 3.4 – Touch Typing

- Know typing terminology including names of fingers.
- Know the home, top and bottom row sections on a keyboard.
- Knows the keys typed with left hand.
- Knows the keys typed with right hand.
- Knows the correct way to sit at a keyboard.

Unit 3.5 – Email

- Know the different methods of communication and know the strengths and weaknesses of his form.
- Know how to open and responding to email.
- Know how to use an address book to write an email.
- Know how to use an email environment safely including the importance of the draft feature.
- Know how to add attachments to an email.
- Know what CC means and how to use it.

Unit 3.6 – Branching Databases

- Know how to sort objects using just YES/NO.
- Know how YES/NO questions are structured and answered.
- Know how to complete a branching database.
- Know how to edit and adapt a branching database.
- Know how to create a branching database including debugging it.

Unit 3.7 – Simulations

- Know that a computer simulation can represent real and imaginary situations.
- Know advantages and problems of using simulations.
- Know how to use a simple simulation to try out different options and test predictions.
- Begin to know how to evaluate simulations by comparing them with real simulations and considering their usefulness.

Unit 3.8 – Graphing

- Know how to set up a graph with a given number of fields using graphing software (2Graph).
- Know how to enter data for a graph.
- Know how to select the most appropriate chart type for their data and explain reasoning.
- Know how to sort data in graphing software to enable easier analysis.

Unit 3.9 – Presenting

- Know what a presentation is and how it can be used.
- Know how to add pages/slides, text and shapes to pages, and also format them.
- Know how to add media such as images, audio and videos.
- Know how to use effects and features such as animations and slide transitions.
- Know how timings can help when presenting and know how to include them in presentations.
- Know how to effectively present to an audience using presentation software.

Unit 3.10 – micro:bit

- Know that a micro:bit is a small computer that needs instructions (code) in order to make it work.
- Know that is has an LED display output that can be used to represent pictures, numbers and words.
- Know how to use the simulator to test code.
- Know how to transfer code from the coding environment onto a micro:bit.
- Know how to code the micro:bit using Free Code for LED outputs and sound outputs.
- Know how to code the micro:bit using Free Code so it can receive inputs from its buttons and accelerometer.
- Know how to code the micro:bit to create events such as playing a tune when an input is detected.

Year 4

Unit 4.1 – Coding

- Begin to know what selection is in computer programming.
- Know how an IF statement works.
- Know how to interpret an IF statement and therefore know how to create a program that includes an IF statement.
- Know how to use co-ordinates in computer programming.
- Know what the 'repeat until' command is.
- Know how an IF/ELSE statement works.
- Know what a variable is in programming.
- Know how to use variables within their programs.
- To know how to create a playable game using a block coding environment.

Unit 4.2 – Online Safety

- Know that information put online leaves a digital footprint or trail and can expand on prior years' scope of this fact.
- Know some of the ways children can protect themselves from online identity theft.
- Know that information put online by users could be used for identity theft.
- Know the main risks and benefits of installing software and applications.
- Know that copying work of others and presenting it as their own is plagiarism.
- Knows the consequences of plagiarism.
- Knows appropriate behaviour when participating or contributing to collaborative online projects for learning.
- Know some of the main positive and negative influences technology has on health and the environment.
- Knows the importance of balancing screen time with non-screen time.

Unit 4.4 – Writing for Different Audiences

- Know how font size and style can affect the impact of a text.
- Know how to use a simulated scenario to produce a news report and campaign using technology.

Unit 4.5 – Logo

- Know the structure of the coding language of Logo.
- Know how to input simple instructions in Logo language environment.
- Know how to create letter shapes using Logo.
- Know what the repeat function in Logo is and its usefulness. Use it to create shapes such as squares.
- Know what procedures are and use this knowledge to build procedures in Logo.

Unit 4.6 – Animation

- Know how animations are created by hand.
- Know how animations are created using computers.
- Know what onion skinning is when referring to animation.
- Know that animations can be enhanced using features in software such as background and sounds.
- Know what 'stop motion' animation is.

Unit 4.7 – Effective Searching

- Know how to find information from a search results page.
- Know how to search effectively to find out information.
- Know how to identify if an information source is true and reliable.

Unit 4.8 – Hardware Investigators

- Know there are key parts that make up a computer.
- Know what each of the key parts is called and the function of them.

Unit 4.9 – Making Music

- Know the main elements of music.
- Know what rhythm and tempo is and able to use this knowledge to experiment with it.
- Know that computers can be used to create music compositions.
- Know how to apply knowledge of music to create own composition using software.

Unit 4.10 – Artificial Intelligence

- Know the basic concept of what artificial intelligence is.
- Know the key impact of artificial intelligence on daily life.
- Know real-life examples of the current use of artificial intelligence.
- Know how to think critically about artificial intelligence including its use in the future.
- Know how to utilise artificial intelligence to create media such as images and music.

Unit 4.11 – Physical Devices: micro:bit

- Know how sensor inputs from the accelerometer can be used to detect movement.
- Know that variables are containers for storing data that can be accessed and updated.
- Know that inputs, outputs and computer code can work together to make control systems.
- Know that logic can be used to make different outputs occur according to inputs by using IF/ELSE statements in code.
- Know how to use infinite loops in control systems to monitor real-word environment changes.

Year 5

Unit 5.1 – Coding

- Begin to know how to simplify code in order to make own programming more efficient.
- Know how to create a simple simulation using 2Code. For example, a traffic light sequence.
- Know what decomposition and abstraction are in computer science.
- Know the need to start coding at a basic level of abstraction to remove superfluous details from own programs.
- Know how to use decomposition to make a plan of a real-life situation.
- Know what a function is in coding and know how to use a function in own program to make it more efficient.
- Know what different variable types are.
- Know what strings are and how to use them.
- Know how to set and change variable values in code.
- Know some of the common ways that text variables can be used in programming.
- Know and use concatenation in own programs.

Unit 5.2 – Online Safety

- Know in more detail from prior learning of the impact that sharing digital content can have.
- Know how to think critically about information they share online.
- Know responsibilities they have for themselves and others regarding online behaviour.
- Know and have developed knowledge from prior years about maintaining secure passwords.
- Know about image manipulation using software and the advantages or disadvantages of this when shared online.
- Know what is meant by appropriate and inappropriate text, photographs and videos.
- Know about the impact of sharing media such as photographs and videos online.
- Know about the importance of citing content online from others and know how to do this.
- Know how to select keywords and search techniques to find relevant information to increase reliability.

Unit 5.3 – Spreadsheets

- Know how to use formulae within a spreadsheet to convert measurements of length and distance.
- Know how to use more advanced formulae effectively. For example, to use formulae to calculate area and perimeter of shapes.
- Know how spreadsheet can be used to model real life situations in order to analyze data, solve problems or test a hypothesis.

Unit 5.4 – Databases

- Know how to search for information within a database.
- Know the different ways to search for information in a database.
- Know how to add information into a shared database.
- Know how to create own database.
- Know how to create new records.
- Know what fields are and know how to correctly add information.
- Know how to phrase questions so they can be correctly answered using a search of database.

Unit 5.5 – Game Creator

- Know what some of the main elements are that make a successful game.
- Know how to plan a playable game.
- Know how to incorporate media such as sound and images.
- Know how to manipulate media including adding animation.
- Know how to successfully evaluate games.

Unit 5.6 – Modelling

- Know what modelling software is and the skills of computer aided design.
- Know the effect of moving points when designing.
- Know how to design a 3D model to fit certain criteria.
- Know how to refine and print a model.

Unit 5.7 – Concept Maps

- Know the need for visual representations when generating and discussing complex ideas.
- Know the uses of a 'concept map'.
- Know what is meant by 'concept map', 'stage', 'nodes' and 'connections.'
- Know how to create a concept map using software such as 2Connect.
- Know that concept maps can be used to retell stories and information.
- Know how to present a concept map to an audience.

Unit 5.8 – Word Processing

- Know what a word processing tool is for.
- Know how to create a word processing document.
- Know how to alter the look of text and navigate around a document.
- Know how to alter page layout including heading and columns.
- Know how to add and edit images.
- Know how to add features to enhance look and usability within a document. For example: textboxes, hyperlinks, contents pages.
- Know how to use tables to present information.

Unit 5.9 – External Devices

- Know what a host means in the context of 2Code Purple Chip and relate this to everyday technology e.g. console and wireless controller.
- Know what is meant by external device in relation to a host device.
- Know what is meant by an application (App).
- Know that a program can be created that will interact with an external device based on inputs and outputs available on the device and what has been coded on the host device. E.g. sound detection on the device sends input to the program triggering code to output alert noise to the device (Simple intruder alarm).
- Know how interaction between an external device and host can be related to real world scenarios, recognising its usefulness.
- Know the extent of functionality with Purple Chip including the code blocks available.
- Know how to utilise the functionality of Purple Chip when designing own program.

Unit 5.10 – Physical Devices: micro:bit

- Know how sensor inputs from the accelerometer can be used to detect movement gestures.
- Use variables to store data from the sensors.
- Use variable to control selection within the program.
- Know how to simulate a control system using the micro:bit temperature sensor
- Know how to connect physical equipment within circuits incorporating the micro:bit and write code to respond to external inputs from these.

Year 6

Unit 6.1 – Coding

- Know how to implement a game which includes timers and a score.
- Know what the launch command is.
- Build on knowledge of functions.
- Know how to use multiple functions in own program.
- Know how to arrange code in multiple tabs.
- Know how to develop creativity when coding to generate novel effects.
- Know the different options of generating user input in 2Code.
- Know how to attribute variables to user input.
- Know the need to code for all possibilities when using user inputs.
- Know how 2Code can be used to make a text-based adventure game.
- Know with improving understanding of how they can alter existing programs to reflect their own ideas.
- Building on existing knowledge of debugging, children know how to debug more effectively.

Unit 6.2 – Online Safety

- Know the benefits and risks of mobile devices broadcasting the location of the user/device, e.g., apps accessing location.
- Know what secure sites are.
- Know that secure sites will have industry standard seals of approval.
- Build on knowledge of Digital Footprints. For example, know how and why people use their information.
- Build on knowledge of appropriate online behaviours and how this can protect themselves and others from possible online dangers. For example, the dangers of promoting inappropriate content online.
- Have greater knowledge of how to make more informed choices of how free time is used.
- Know the effects on individual health when having too much screen time.

Unit 6.4 – Blogging

- Know the purpose of writing a blog.
- Know the features of successful blog writing.
- Know how to plan a blog.
- Know how to write a blog.
- Know how to write a blog post.
- Know that the way information is presented within a blog has an impact upon the audience.
- Know how to contribute to others' blogs.
- Know the importance of having an approval process when creating blog content or modifying it.
- Know from Online Safety knowledge that content within blogs applies. For example, children know the issues surrounding inappropriate posts and cyberbullying.

Unit 6.5 – Text Adventures

- Know what a text based adventure is.
- Know how to convert a simple story with 2 or 3 levels of decision making into a logical design.
- Know how to use the functionality of 2Create a Story Adventure mode to create, test and debug using plans.
- Know the difference between a map-based game and a sequential story-based game.
- Know how to use written plans to code a map-based adventure using 2Code.
- Know how to recall existing knowledge to support coding a map-based adventure game. For example, using functions, two-way selection (IF/ELSE statements) and repetition.

Unit 6.6 – Networks

- Know the difference between the World Wide Web and the Internet.
- Know what a WAN and LAN is and the key differences between them.
- Know how a school network accesses the Internet.
- Know the history of the Internet.
- Know some of the major changes in technology which have taken place in their lifetime.

Unit 6.7 – Quizzing

- Know how to use create activities for younger children using software such as 2DIY.
- Know about different question types within quizzing software tools such as 2Quiz.
- Know how to give and respond to feedback based on quizzes made.
- Know how to create their own grammar games.
- Know how to use multiple pieces of software to enhance a quiz. For example, creating a quiz that requires children to look up information on a database.

Unit 6.8 – Binary

- Know that all data in a computer is saved in the computer memory in a binary format.
- Know that binary uses only the integers 0 and 1.
- Know that we can relate 0 as an 'off' switch and 1 to an 'on' switch.
- Know how to count up from 0 in binary using visual aids if required.
- Know that bits are related to computer storage.
- Know how to convert numbers to binary using the division by two method.
- Know how to use a converter tool to check binary conversions.

Unit 6.9 – Spreadsheets

- Know the uses of spreadsheets and familiar with the spreadsheet environment.
- Know how to navigate around a spreadsheet using cell references.
- Know key vocabulary: Cells, columns, rows, cell names, sheets, workbooks.
- Know how to use a spreadsheet to carry out basic calculations including addition, subtraction, multiplication and division formulae.
- Know how to use the series fill function.
- Know that using formulae allows the data to change and the calculations to update automatically.
- Know how to use a spreadsheet to solve a problem.
- Know how to use the SUM function.
- Know how to manipulate the way data is presented. For example, flash fill, convert text to tables, splitting cells, sorting data.
- Know what is meant by a delimiter.
- Know how to create formulae that deals with percentages, averages, max and min.
- Know what range notation is.
- Know that there are ways to present data graphically.

- Know how to use charting features to create charts from data in cells.
- Know how to use sparklines and data bars to illustrate data.
- Know the advantages to using formulae when data is subject to change in a spreadsheet.
- Know how to print spreadsheets.